Decontamination of Radioactive Contaminants from Water with Vermiculite

AUTHOR(S):

Shigematsu, Tsunenobu; Oshio, Toshiki

CITATION:

Shigematsu, Tsunenobu ...[et al]. Decontamination of Radioactive Contaminants from Water with Vermiculite. Bulletin of the Institute for Chemical Research, Kyoto University 1961, 39(3): 262-262

ISSUE DATE:

1961-07-31

URL:

http://hdl.handle.net/2433/75810

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Tsunenobu SHIGEMATSU and Toshiki OSHIO

Isotopes and Radiation, **3**, 170 (1960)

Although the ion excange process is one of the most efficient methods for removing radioactivity from water, the cost of the ion exchange resins may limit widespread use unless suitable regeneration techniques are developed.

The clay mineral vermiculite exhibits the exchange of lattice ions, and the removal efficiencies of vermiculite do not appear to be significantly different from the sulfonic acid type cation exchange resins. In order to determine to determine the breakthrough capacity of the vermiculite, a calcium chloride solution (10^{-3} *M* as Ca) was passed through a column filled with sodium form vermiculite regenerated by 3% sodium chloride solution, and fraction of the effluent were analysed for the calcium ion. And effect of acid treatment of the ore on the breakthrough capacity was examined.

The usable 10 per cent breakthrough capacities of 20 samples of vermiculite (20 to 60 mesh) were 0.26~0.58 (mean 0.40) and 0.38~0.83 (mean 0.58) meq./g. for 40 and 100 gram sodium chloride regenerant per liter. When the concentration of hydrochloric acid for the acid treatment of a sample was varied from 0.01 to 6 *M*, the maximum Na-Ca ion exchange capacities with 40, 60, 100, and 250 gram NaCl per liter regeneration level were 0.57, 0.78, 0.87, and 0.95 meq./ml., respectively. Using a 1 *M* hydrochloric acid for the acid treatment, the breakthrough capacities of the acid treated 20 samples were 0.29~0.65 (mean 0.46) and 0.36~0.87 (mean 0.63) meq./ml. for 40 and 100 gram per liter regeneration level. Among these raw ore samples, usable breakthrough capacity of brownish ores is higher that of greenish ores, and this shows that the capacity depends on the chemical composition of vermiculite.

For the most effective removal of caesium and strontium from water, vermiculite is recommended. The removal efficiency of 99% or higher is possible.

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Synthesis of Polyoxazolidone and its Ring Cleavage

Ryohei ODA, Sohei TOKIURA, Akira MIYASU and Masaya OKANO

Kobunshi Kagaku (Chemistry of High Polymers) **17**, 72(1960)

Some polyoxazolidones were prepared by the polyaddition of aliphatic or aromatic diisocyanate with diepoxy compounds. The products obtained are almost insoluble in organic solvents, and decompose above ca. 280°C without fusion. This may be due to some crosslinking which is formed after the polyaddition. The